

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: YUTAKA MATSUNOBU ET AL
Serial No.: NOT YET ASSIGNED
Filed: FEBRUARY 8, 2002
Title: HYBRID ELECTRICAL VEHICLE EMPLOYING PERMANENT
MAGNETIC TYPE DYNAMO-ELECTRIC MACHINE

PRELIMINARY AMENDMENT

Box Patent Application
Commissioner for Patents
Washington, D.C. 20231

February 8, 2002

Sir:

Please enter the following amendments to the claims prior to the examination of the application.

IN THE CLAIMS:

Please cancel claims 1, 3, 4, 6 and 11, 12, 15, 16 and amend the remaining claims as follows: **(A copy of the marked-up version of amended claim 2, 5, 8, 9, 13 and 17 are attached to this Preliminary Amendment).**

2. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 5, wherein a shape in a circumferential direction of said rotor at each pole is nonsymmetrical so that the

ratio between the normal and reverse rotations establishes a relation 1 : 1.05-1.2, whereby the torque at the reverse rotation becomes greater.

5. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine comprising:

a permanent magnet type dynamo-electric machine, said permanent magnet type dynamo-electric machine having a stator having a stator iron core around which a stator coil is wound, and a rotor arranged in said stator and separated therefrom by a rotational gap, said rotor having a plurality of permanent magnets arranged and fixed within a rotor iron core in a peripheral direction, and having auxiliary protruding poles;

said dynamo-electric machine and an engine being connected to a drive shaft in series; and

no switching gear between forward and backward movements being provided; wherein,

a ratio between a maximum torque output by said dynamo-electric machine when the electric vehicle moves forward and a torque output by the dynamo-electric machine when reverse moving establishes a relation 1 : 1.05-1.2, whereby the torque at the reverse rotation becomes greater; and

a permanent magnet inserting hole provided within said rotor iron core is provided at a predetermined inclined angle (θ) with respect to a circumferential direction so that a distance from the rotational gap is greater in the normal rotation side of the dynamo-electric machine, and said permanent magnet is inserted to said inserting hole.

8. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 2, wherein said inclined angle (θ) is 10 to 45 degrees (mechanical angle).

9. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 5, wherein a cross sectional shape in the rotational direction of said permanent magnet inserting hole and said permanent magnet is a rectangular shape.

13. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 5, wherein a cross sectional shape in the rotational direction of said permanent magnet inserting hole and said permanent magnet is an arc shape.

17. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 5, wherein a ratio between a width in a rotational direction of the permanent magnet inserting hole provided

within said rotor iron core and a width in the rotational direction of said permanent magnet is 1 : 0.5-0.9.

(Applicant's Remarks are set forth hereinbelow, starting on the following page.)


REMARKS

Entry of the amendments to the claims before examination of the application is respectfully requested. These claims patentably define over the art of record.

If there are any questions regarding this Preliminary Amendment or this application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381AS/49196DV).

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend the claims as follows:

2. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim [1,] 5, wherein a shape in a circumferential direction of said rotor at each pole is nonsymmetrical so that the ratio between the normal and reverse rotations establishes a relation 1 : 1.05-1.2, whereby the torque at the reverse rotation becomes greater.

5. (Amended) [A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim 1, wherein] A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine comprising:

a permanent magnet type dynamo-electric machine, said permanent magnet type dynamo-electric machine having a stator having a stator iron core around which a stator coil is wound, and a rotor arranged in said stator and separated therefrom by a rotational gap, said rotor having a plurality of permanent magnets arranged and fixed within a rotor iron core in a peripheral direction, and having auxiliary protruding poles;

said dynamo-electric machine and an engine being connected to a drive shaft in series; and

no switching gear between forward and backward movements being provided; wherein,

a ratio between a maximum torque output by said dynamo-electric machine when the electric vehicle moves forward and a torque output by the dynamo-electric machine when reverse moving establishes a relation 1 : 1.05-1.2, whereby the torque at the reverse rotation becomes greater; and

a permanent magnet inserting hole provided within said rotor iron core is provided at a predetermined inclined angle (θ) with respect to a circumferential direction so that a distance from the rotational gap is greater in the normal rotation side of the dynamo-electric machine, and said permanent magnet is inserted to said inserting hole.

8. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim [6,] 2, wherein said inclined angle (θ) is 10 to 45 degrees (mechanical angle).

9. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim [1,] 5, wherein a cross sectional shape in the rotational direction of said permanent magnet inserting hole and said permanent magnet is a rectangular shape.

13. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in claim [1,] 5, wherein a cross sectional shape in the rotational direction of said permanent magnet inserting hole and said permanent magnet is an arc shape.

17. (Amended) A hybrid electric vehicle employing a permanent magnet type dynamo-electric machine as claimed in [any one of claims 1-16,] claim 5, wherein a ratio between a width in a rotational direction of the permanent magnet inserting hole provided within said rotor iron core and a width in the rotational direction of said permanent magnet is 1 : 0.5-0.9.